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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,194	12/05/2003	Qi Xiang	039153-5002 (G0166)	2402

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EXAMINER


NGUYEN, KHIEM D

ART UNIT PAPER NUMBER

2823

DATE MAILED: 06/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/729,194	XIANG, QI	
	Examiner	Art Unit	
	Khiem D. Nguyen	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-19 and 22-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-19 and 22-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Election/Restrictions***

Applicant's election without traverse of Group II, claims 12-19 in the reply filed on April 18th, 2005 is acknowledged. The non-elected claims 1-11 and 20-21 requested to be cancelled without prejudice by the Applicant. Claims 22-34 are being added. Thus, claims 12-19 and 22-34 are now pending in this application.

Claim Rejections - 35 USC § 102

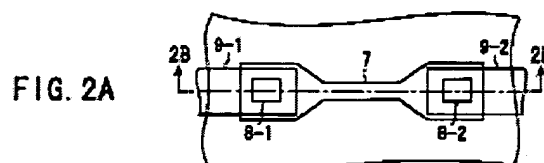
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

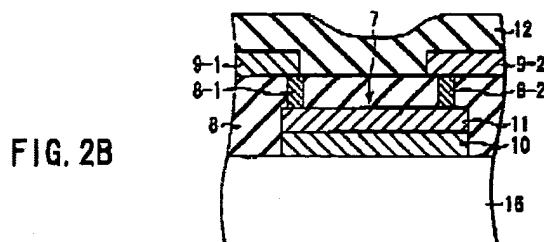
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 12-19, 22-25, 28-30 and 33-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Toyoshima (U.S. Patent 6,703,680).

In re claim 12, Toyoshima discloses a fuse for an integrated circuit, the fuse comprising a material **11** capable of existing in a first phase (NiSi) or a second phase (NiSi₂) in response to at least one of a current signal and a voltage signal, the fuse having a different resistance in the first phase (20 $\mu\Omega\text{cm}$) than in the second phase (60 $\mu\Omega\text{cm}$) (col. 3, lines 15-56 and FIGS. 2A-B).



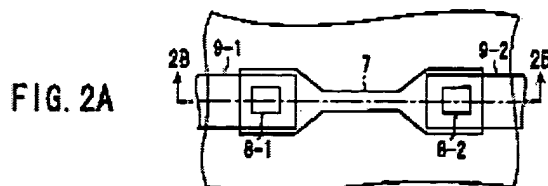
In re claim 13, **Toyoshima** discloses that the fuse further comprises a layer of material including silicon 10 and a silicide layer 11 (col. 3, lines 19-45 and FIG. 2B).

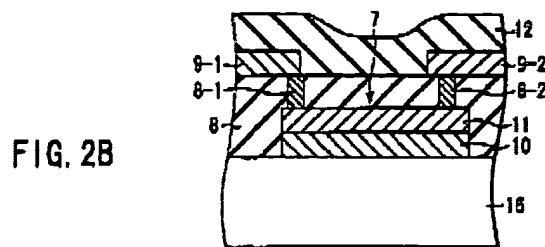


In re claim 14, **Toyoshima** discloses that the silicide 11 includes nickel (NiSi) (col. 3, lines 19-45).

In re claim 15, **Toyoshima** discloses that the first phase includes mononickel silicide (NiSi) and the second phase includes nickel disilicide (NiSi₂) (col. 3, lines 35-45).

In re claim 16, **Toyoshima** discloses an integrated circuit comprising: a polysilicon layer 10 disposed above an insulative structure 16; and a silicide layer 11 disposed above the polysilicon layer 10, the silicide layer 11 being a first type (NiSi) and being convertible to a silicide layer of a second type (NiSi₂) in response to a signal, wherein a resistance of the silicide layer changes when the silicide layer is converted from the first type (20 $\mu\Omega\text{cm}$) to the second type (60 $\mu\Omega\text{cm}$) (col. 3, lines 35-56 and FIGS. 2A-B).





In re claim 17, **Toyoshima** discloses that the silicide layer of the first type is mononickel silicide (NiSi) (col. 3, lines 35-45).

In re claim 18, **Toyoshima** discloses that the silicide layer of the second type is nickel disilicide (NiSi₂) (col. 3, lines 35-45).

In re claim 19, **Toyoshima** discloses that the insulative structure is a field oxide or an insulative layer (FIG. 7).

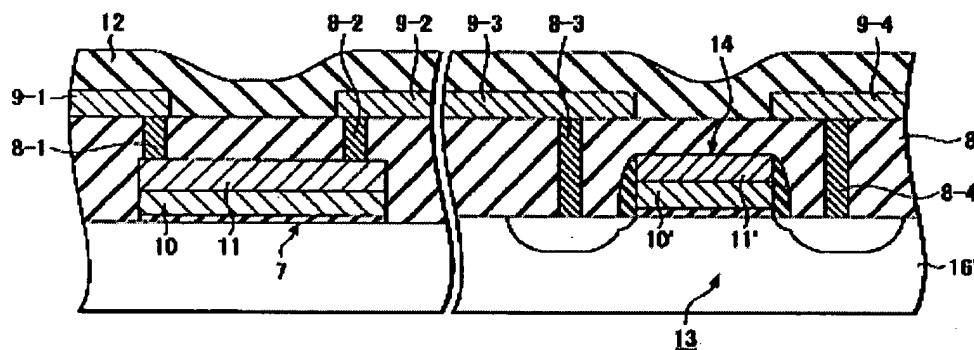
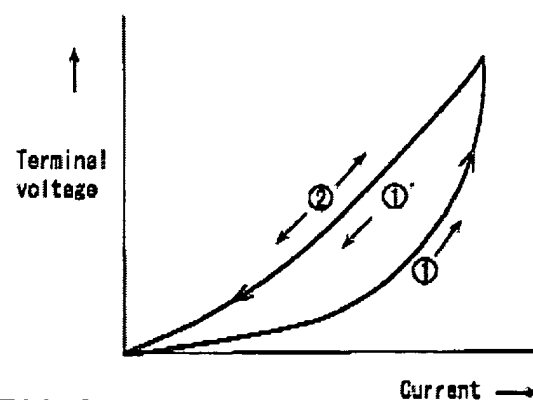
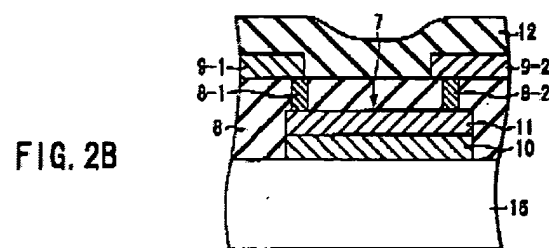
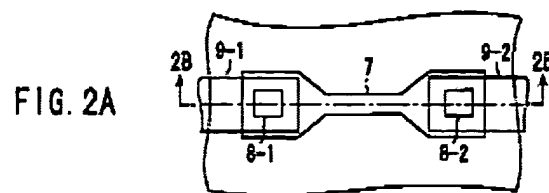


FIG. 7

In re claim 22, **Toyoshima** discloses a fuse comprises: means for having a first phase (NiSi) and a second phase (NiSi₂), the first phase (20 $\mu\Omega\text{cm}$) having a different resistivity than the second phase (60 $\mu\Omega\text{cm}$) (col. 3, lines 35-45); and means for receiving

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a current and changing the means for having from the first phase to the second phase with the current (col. 3, line 46 to col. 4, line 8 and FIGS. 2A-3).



In re claim 23, Toyoshima discloses that the second phase ($60 \mu\Omega\text{cm}$) is a relatively higher resistance than the first phase ($20 \mu\Omega\text{cm}$) (col. 3, lines 35-45).

In re claim 24, Toyoshima discloses that the current is a programming current (col. 3, line 46 to col. 4, line 8).

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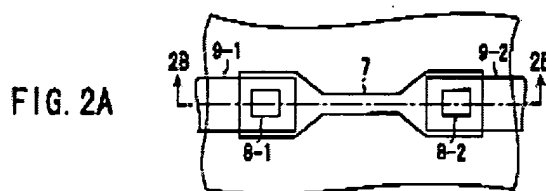
In re claim 25, Toyoshima discloses that the means for having is a material having a first sheet resistance in the second phase of at least two times of a second sheet resistance in the second phase (col. 3, lines 35-45).

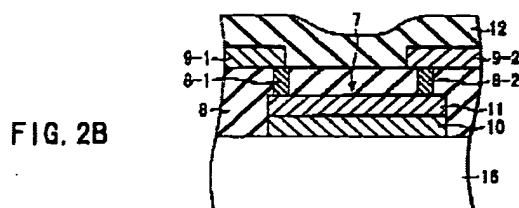
In re claim 28, Toyoshima discloses that the means for having is a material including nickel (NiSi) (col. 3, lines 35-45).

In re claim 29, Toyoshima discloses that the material is a silicide (NiSi) (col. 3, lines 35-45).

In re claim 30, Toyoshima discloses that first phase includes mononickel silicide (NiSi) and the second phase includes nickel disilicide (NiSi₂) (col. 3, lines 35-45).

In re claim 33, Toyoshima discloses that a fuse for an integrated circuit, the fuse comprising: a silicide layer (NiSi) 11; and a layer including silicon 10, the layer including silicon being above a bulk silicon substrate 16 or a field oxide structure and below the silicide layer, wherein the silicide layer is configured in a fuse pattern, wherein the silicide layer 11 is in a first phase (NiSi), the first phase being convertible to a second phase (NiSi₂), the first phase (20 $\mu\Omega\text{cm}$) having a different resistance characteristic than the second phase (60 $\mu\Omega\text{cm}$) (col. 3, lines 15-56 and FIGS. 2A-B).





In re claim 34, Toyoshima discloses that the fuse of claim 33 further comprising: conductive vias 8-1, 8-2 at a first end and a second end of the fuse pattern (col. 3, lines 19-34 and FIGS. 2A-B).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 26-27 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toyoshima (U.S. Patent 6,703,680).

In re claims 26-27, Toyoshima discloses a first sheet resistance that is several times the second sheet resistance (col. 3, lines 19-56) but does not explicitly disclose that the first sheet resistance is at least 8 times the second sheet resistance as recited in claim 26, and approximately 10 times the second sheet resistance as recited in claim 27.

However, there is no evidence indicating the ranges of the first and second sheet resistance is critical and it has been held that it is not inventive to discover the optimum or workable range of a result-effective variable within given prior art conditions by routine experimentation. See MPEP § 2144.05. Note that the specification contains no

disclosure of either the critical nature of the claimed dimensions of any unexpected results arising there from. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

In re claims 31-32, **Toyoshima** does not explicitly disclose that the first phase has a sheet resistance between 1-5 ohms per square and the second phase has a sheet resistance between 10 and 40 ohms per square.

However, there is no evidence indicating the ranges of the sheet resistance of the first and second phase is critical and it has been held that it is not inventive to discover the optimum or workable range of a result-effective variable within given prior art conditions by routine experimentation. See MPEP § 2144.05. Note that the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising there from. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D. Nguyen whose telephone number is (571) 272-1865. The examiner can normally be reached on Monday-Friday (8:30 AM - 5:30 PM).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (571) 272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

K.N.
June 17th, 2005

A handwritten signature in black ink, appearing to read 'W. David Coleman', with a stylized, looping flourish at the end.

**W. DAVID COLEMAN
PRIMARY EXAMINER**